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ORIGINAL PAPER

Cognitive Behavioral Therapy for Postdisaster Distress: A Community Based Treatment Program for Survivors of Hurricane Katrina

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Abstract Many disaster survivors suffer from postdisaster distress regardless of whether or not they meet criteria for specific psychiatric diagnoses. Cognitive Behavior Therapy for Postdisaster Distress (CBT-PD), a ten-session manualized intervention, was developed to address a range of cognitive, emotional, and behavioral reactions to disaster. Trained community-based therapists provided CBT-PD to adult survivors of Hurricane Katrina as part of *InCourage*, a program sponsored by the Baton Rouge Area Foundation. Participants ($n = 88$) who were assessed at referral, pretreatment, intermediate treatment, and posttreatment showed significant and large improvements. The overall pre-post effect size was 1.4 in intention-to-treat analyses. Improvements were comparable for persons with more severe distress and persons with moderate distress at referral. Benefits were maintained at follow-up for the 66 adults who have been assessed.

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Hundreds of studies have been published on the effects of disasters on mental health. To date, posttraumatic stress disorder (PTSD) has been the condition most often measured and observed in these studies (Norris and Elrod 2006; Norris et al. 2002), with prevalences in the range of 30–40% among direct victims, 10–20% among rescue workers, and 5–10% among the general population (Galea et al. 2005). However, the adverse outcomes associated with disasters go well beyond PTSD to include depression, anxiety, and other psychiatric problems, as well as physical complaints, interpersonal problems, and deteriorating psychosocial resources (Norris and Elrod 2006; Norris et al. 2002).

Despite the wealth of research regarding the mental health effects of disaster, little is known about what types of treatments are most effective several months postdisaster. What is known comes primarily from studies on disaster-related PTSD. We identified three randomized controlled trials for disaster survivors with PTSD. Two of these studies were in response to an earthquake in Turkey and involved a single-session exposure intervention compared to either a wait-list control or repeated assessment (Basoglu et al. 2007, 2005) and the third compared up to 12 sessions of cognitive therapy to a wait-list control in survivors of terrorism and other civil conflict (Duffy et al. 2007). In all three studies, the cognitive behavioral interventions were superior to the control conditions. Uncontrolled studies of cognitive behavioral therapy for disaster-related PTSD found similarly positive effects (e.g., Brewin et al. 2008; Gillespie et al. 2002; Levitt et al. 2007).

While these studies are informative, they focus exclusively on treating survivors with PTSD. Only two treatment

studies did not require participants to meet diagnostic criteria for PTSD (Chemtob et al. 1997; Silver et al. 2005). Instead participants were selected for their level of disaster exposure rather than for their particular symptoms. However, these studies were still centered primarily on PTSD either in their measurement or treatment focus.

We believed there may be significant advantages to developing a treatment approach that is focused more broadly on postdisaster distress rather than PTSD specifically. "Postdisaster distress" encompasses a range of cognitive, emotional, and behavioral reactions to disaster, including symptoms of PTSD, depression, stress vulnerability, and functional difficulties. Postdisaster distress is not a psychiatric diagnosis. Within certain limits, distress is perfectly natural and normal and can be expected to improve on its own. Sometimes, however, this distress becomes severe and/or prolonged enough to interfere with quality of life.

One advantage of taking a broader approach is that it could assist individuals who present with other primary reactions, such as depression, mixed conditions, or subclinical conditions. This multi-symptom approach could potentially be implemented across a range of disasters, regardless of whether loss/depression or trauma/PTSD predominates. Diagnosis has often been equated with treatment need in the literature, but research shows that many people with disorders do not perceive themselves as needing help, whereas some people without disorders do (Katz et al. 1997; Meadows et al. 2000; Nelson and Park 2005). Second, a treatment that addresses a variety of postdisaster stress reactions could be disseminated to community clinicians through a single training rather than through multiple trainings for treatments in PTSD, depression, and other diagnoses. Time is of the essence after disaster, and often there is a need to train many clinicians very quickly. Therefore, the approach is potentially cost effective and efficient, quickly preparing a large number of clinicians to be able to respond to the disaster. Third, a focus on distress as opposed to diagnosis reduces the need for the extensive assessment that is often associated with clinical research and thus may increase the feasibility of the treatment's use in community as opposed to university-based clinics. Finally, a treatment focused on postdisaster distress or stress is potentially more acceptable to survivors who may be suffering from mental health problems for the first time. Stigma is a significant barrier to care (Wills and Holmes-Rovner 2006). Having a treatment available that does not require a psychiatric diagnosis may significantly increase the chance that survivors will access the treatment.

Cognitive Behavioral Therapy for Postdisaster Distress (CBT-PD; Hamblen et al. 2006) is a disaster-specific intervention that has been used following the September 11th 2001 terrorist attacks and the 2004 Florida Hurricanes. It is intended for use at least 90 days postdisaster, once the initial transient stress response has had time to resolve. CBT-PD is a manualized treatment that has a primary focus on identifying and challenging maladaptive disaster-related beliefs. It includes psychoeducation, breathing retraining, behavioral activation, and cognitive restructuring. Evaluation was minimal in the first pilots of the approach, but preliminary results were promising (Donahue et al. 2006; Hamblen and Norris 2007), and it appears that it can be rapidly disseminated to community-based clinicians (Hamblen et al. 2009). In this paper, we report results of CBT-PD delivered as part of *InCourage*, a mental health initiative sponsored by the Baton Rouge Area Foundation to provide free treatment to individuals affected by Hurricane Katrina. We sought to answer the following questions: (1) Did participants improve over the course of treatment? (2) Is improvement greater for the cognitive restructuring component as compared to psycheducation plus coping skills components? (3) Did survivors with moderate and severe levels of distress improve comparably? and (4) Are the improvements associated with CBT-PD maintained at follow-up?

Method

Participants

Between January 2007 and January 2008 (approximately 1½–2½ years post Katrina), 205 adults who had been exposed to either Hurricane Katrina or Hurricane Rita enrolled in InCourage. Of these, 190 provided pretreatment data, 93 completed the program, and 88 provided complete data on the four repeated assessments: referral, pretreatment, intermediate, and posttreatment. Except where noted, the sample description applies to these 88 individuals. Five-month follow-up was conducted for 66 of the 88 completers. The median number of days between referral and enrollment was 8; between enrollment and completion, 106; and between completion and follow-up, 146.

All participants lived in the greater Baton Rouge area (74% in East Baton Rouge Parish), and most (89%) had been displaced by Hurricane Katrina. Most of these adults were women (82%). About 19% were age 18–39, 73% were age 40–59, and 8% were age 60 or older. Over half (52%) of the participants were African American, 41% were non-Hispanic White, and 7% were other or mixed race/ethnicity (5 Latino, 1 American Indian). Approximately 10% of participants had less than a high school education, 66% had completed high school or had some college, and 24% were college graduates. Traumatic stressors included injury (14%), life threat (36%), family member missing or dead (35%), friend missing or dead (55%), witnessing injury (39%), and participating in rescue

or recovery efforts (25%). Other stressors included damage to home (84%), disaster-related unemployment (51%), and other financial loss (86%).

Measures

The 12-item Short Post-Traumatic Stress Disorder Rating Interview—Expanded (Sprint-E; Norris et al. 2006) was administered five times: at the point of referral, at the beginning of Session 1 (pretreatment), at the beginning of Session 3 (intermediate treatment), at the beginning of Session 10 (posttreatment), and at 4 months follow-up. The first 11 items of the Sprint-E assess disaster-related PTSD symptoms, depression, stress vulnerability, functional impairment, and perceived need for assistance for the past week (pretreatment, intermediate, posttreatment, follow-up) or past month (referral only) on a 5-point scale (*not at all* = 1, *very much* = 5). The 12th item, a suicidality check, is not included in the score. As a screening tool, the Sprint-E is scored as the number of intense reactions, where an "intense reaction" is an item with a score of 4 or 5, but to evaluate change related to CBT-PD, we used the entire range of the measure, scored as the sum of the first 11 items (range = 11–55; αs = .83–.95).

Previous research conducted with 165 adults enrolling in a Florida treatment program after the 2004 hurricanes suggested that persons who report 7 or more intense reactions on the Sprint-E are highly likely to suffer from current PTSD or a related disorder (Norris et al. 2008). We used this cut-point to determine if CBT-PD outcomes varied across individuals with moderate (<7) or severe (7+) postdisaster distress at the point of referral.

Procedures

Clients were recruited for the InCourage program through advertisements, clinician referrals, and direct calls to the Baton Rouge Crisis Intervention Center (BRCIC). InCourage advertised free treatment for people in Greater Baton Rouge experiencing "stress or anxiety" as a result of Hurricane Katrina. At the point of referral, the Sprint-E was administered by a telephone counselor at BRCIC. Counselors used a Sprint-E score of three or more intense reactions as the typical criterion for referral to InCourage, but were given discretion to refer anyone to the program. Clients were referred to a therapist convenient to their location, but it was up to the client to contract the therapist and set up the first appointment. At pretreatment, intermediate treatment, and posttreatment sessions, the Sprint-E was administered by a trained therapist. To keep the evaluation brief for this community-based project, no other distress measures were included in the evaluation protocol. Permission to follow-up was requested at posttreatment. All completers consented and provided contact information on an additional questionnaire that was kept separate from their other data. The follow-up interview was conducted by telephone by a trained research assistant.

Treatment

CBT-PD is a manualized, 10-session intervention that has a primary focus on identifying and challenging maladaptive disaster-related beliefs (see Hamblen et al. 2006 for details on CBT-PD). The intervention includes four components: psychoeducation, breathing retraining, behavioral activation, and cognitive restructuring. Clients receive a workbook and complete assignments to reinforce the skills they have learned in session.

Psychoeducation

Provided in the first session, psychoeducation aims to provide clients with an understanding of common reactions to disaster. The workbook includes educational information on common reactions, such as fear and anxiety, sadness and depression, guilt and shame, and anger; PTSD symptoms; symptoms of depression, anxiety, substance use, grief and bereavement, sleep problems and nightmares, and impairments in functioning. By focusing on client's individual problems, the therapist begins to tailor the treatment and build rapport and trust.

Breathing Retraining and Behavioral Activation

Beginning in session two clients are taught some immediate ways of managing their distress as well as skills for decreasing future distress. Two main skills are taught, breathing retraining and behavioral activation. Breathing retraining is a skill for managing and decreasing anxiety. It involves teaching clients how to slow their breathing in order to reduce hyperventilation by taking in normal breaths and exhaling slowly often while saying a soothing self-statement such as "calm" or "relax." Next, clients are taught about the relationship among thoughts, feelings, and behaviors—that negative behaviors are connected to negative moods, while positive behaviors are connected to positive moods. Behavioral activation is introduced as an effective way to combat depression and avoidance. Clients are asked to identify and engage in positive activities in their life by scheduling three new pleasant activities each week. In identifying pleasant activities, therapists help clients select activities that are both pleasant and that decrease avoidance. Clients are encouraged to use the breathing retraining and behavioral activation throughout the course of the treatment.

Cognitive Restructuring

In session three, clients are introduced to the concept that people's emotional reactions to events are determined by their interpretations of those events. These interpretations may be influenced by other events the person has experienced, including traumatic events. Clients are informed that different types of negative feelings are associated with specific types of thoughts, which are often automatic and occur outside of their awareness. Clients identify upsetting situations and the associated thoughts and feelings.

In session four, clients are introduced to the cognitive distortions (called problematic thinking styles) that may result from basing current thinking on past traumatic experiences. Clients are apprised of common problematic thinking styles and are helped to identify and correct distortions related to negative emotions.

Thereafter, clients are introduced to a five-step cognitive restructuring (CR) method for dealing with negative emotions (Mueser et al. 2004). These steps are summarized on a worksheet, which is used both in the session with the therapist and practiced by the client outside of the session on his or her own or with the help of another person. The five steps of CR are: (1) describe the situation, (2) identify the negative feeling, (3) identify the thought related to the feeling, (4) challenge the thought, and (5) make a decision. Clients practice CR for the remainder of the treatment sessions. The goal is to help clients move from learning CR as a skill to applying it to their disaster-related thoughts and from using the formal CR worksheet to completing the steps in their head when they are in an upsetting situation or immediately after it is over.

At the beginning of the last session clients are reassessed. If significant progress is made clients are praised for their accomplishments and therapists discuss strategies for maintaining these gains. If modest progress is made, therapists emphasize that improvement may continue after the treatment is completed and encourage clients to continue to practice their new skills. A referral can be made if necessary. If there are no-treatment gains, therapists discuss with clients what got in the way of treatment, identify future treatment goals, and make appropriate referrals.

Therapists

Therapists from greater Baton Rouge were recruited for the *InCourage* program through the mailing lists of state licensing boards for Psychologists, Professional Counselors, and Clinical Social Workers. To be eligible, therapists were required to show proof of license and insurance and to hold at least a master's degree in a mental health field. Therapists were selected based on (1) the date their application was received, (2) eligibility criteria, and (3) background in CBT. One hundred eleven therapists attended the full two-day training of which 104 completed both pre and post training questionnaires. Therapists were required to sign contracts indicating that they would (1) attend a two-day training, (2) attend bi-weekly case consultation calls, (3) complete standardized evaluation, billing, and fidelity forms, (4) deliver CBT-PD, and (5) accept $80 per therapy hour.

Most (77%) of the 104 therapists who completed the pre-training questionnaire were women. Their ages ranged widely from 30 to 74 years ($M = 50$, $SD = 10$). All had either a masters (71%) or doctoral (29%) degree and no less than 2 years previous clinical experience ($M = 16$, $SD = 8$). Most therapists (63%) had used a manual in therapy before, and few expressed serious concerns about their use. Most considered themselves to have a cognitive behavioral orientation, at least partly (most important 45%, second most important 25%).

Therapist Training, Consultation, and Adherence

Therapists attended a two-day training in CBT-PD with on-going case consultation. The training, provided by the first author (JH), included a combination of modalities such as lecture, practice exercises, expert demonstration (including live and video demonstrations), and role plays. Therapists showed significant improvements in their ratings of the importance of various elements of cognitive behavioral therapy, their knowledge and understanding of those elements, and their confidence that they could use them effectively. Immediately following the training, 90% of therapists' demonstrated excellent retention of CBT-PD.

Of the trained therapists, 47 later treated between one and eight clients each. These therapists attended a bi-weekly case conference with an expert selected by the first author (JH). These calls aimed to provide therapists with on-going support in the intervention and to increase adherence to the manual.

While taping of sessions was not possible given the real-world application of the treatment, fidelity forms were created to assess the presence or absence of critical session elements. Therapists completed measures after each therapy session. The number of critical elements ranged from 4 to 7 depending on the particular session, each scored 0 (absent) or 1 (present). Session fidelity was scored as the average of the elements, with scores ranging from 0 (all elements absent) to 1 (all elements present). Therapists' reported fidelity was extremely high across all sessions. Session fidelity scores ranged from .98 (Session 1) to 1.0 (Session 10).

Evaluation Design and Data Analysis

The InCourage evaluation relied upon a "quasi-experimental" time-series design. Experimental designs are

superior but require a control group, which was not feasible for this community-based treatment program. The essence of the time-series design is a periodic measurement process and the introduction of a treatment into this series of measurements (Campbell and Stanley 1963). The effects of the treatment are indicated by a discontinuity in the slope of change across the measurement points; the ideal case is illustrated in Fig. 1.

A quasi-experimental approach includes investigators' attempts to eliminate rival explanations of observed changes. Natural recovery is typically a plausible rival hypothesis of observed improvements in treatment when there is no control group. This threat was not a great concern here because 16 months or more had passed since Hurricane Katrina, well past the point where spontaneous, natural improvements were expected. However significant improvements between referral and pretreatment assessments and between posttreatment and follow-up assessments would make this rival explanation more plausible than if improvements were limited to the intervals between pretreatment and posttreatment assessments. The two pretreatment data-points help to rule out regression artifacts wherein people selected on the basis of high scores would be expected to improve because of measurement error. Repeated assessments are also helpful for considering the extent to which mortality (attrition) might have influenced the external validity of results (e.g., if non-completers were significantly more or less distressed than others at pretreatment). However, a single-group design cannot clearly distinguish the specific effects of CBT-PD from the nonspecific effects of a therapeutic relationship.

The hypotheses were tested in a 2 × 4 repeated measures ANOVA with postdisaster distress (Sprint-E) as the dependent measure. Session, the within-subjects factor, had four levels: referral, pretreatment, intermediate treatment, and posttreatment. The Session effect was apportioned into

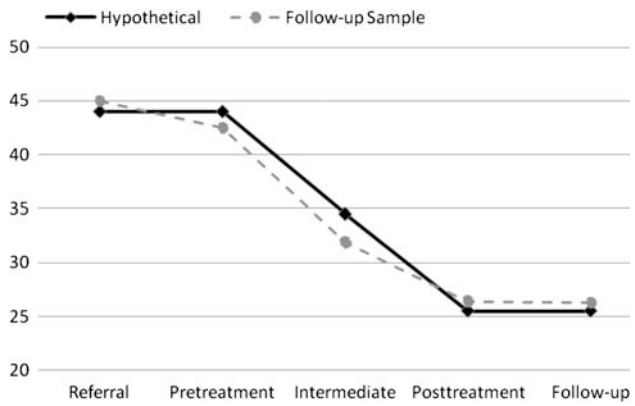

Fig. 1 Hypothetical, idealized trend showing significant change in postdisaster distress during treatment with stability before and after treatment. Also shown is the observed trend in Sprint-E means for the 66 participants with follow-up data

three non-orthogonal contrasts testing the mean at each point against the previous point. We hypothesized that significant change would occur between pretreatment and intermediate treatment assessments, and again between intermediate treatment and posttreatment assessments, with the latter effect being the greater of the two. Severity (of initial distress), the between-subjects factor, had two levels: moderate distress (<7 intense reactions) and severe distress (7+ intense reactions) on the Sprint-E at referral. At the point of referral, 72 (82%) of the 88 completers were severely distressed (7 or more intense reactions on the Sprint-E), whereas the remaining 16 persons were moderately distressed (<7 intense reactions). A main effect of Severity was expected but of minimal interest because the severe distress group had higher symptoms than the moderate distress group at referral by definition. Of more interest was the possibility of interactions between Severity and Session that might point to limitations of the client population for which CBT-PD is effective. The effect size of each contrast (Cohen's d) was calculated as the mean difference (M diff) between the two relevant time-points divided by its standard deviation (Kotrlik and Williams 2003). The "rule of thumb" for interpreting these effect sizes is that $d = 0.20$ indicates a small (but not trivial) effect, $d = 0.50$ indicates a medium effect, and $d = 0.80$ indicates a large effect.

Because of the biases possible in completer analyses, we also adopted mixed longitudinal modeling with maximum likelihood estimation as a data analysis strategy. Mixed longitudinal modeling utilizes all available data from study participants. It also models correlated repeated measures for each participant and individual variability in change, with a random intercept and a random time slope for individuals. To ensure the correct estimation of variance and covariance structure, baseline measures (at referral) were included in the model as the first of all repeated measures. In this model, measurement points (e.g., referral, pretreatment, intermediate, posttreatment) were treated as a categorical variable. In addition, we calculated least squares means at each measurement point to calculate effect sizes between different measurement points. These analyses were performed according to the intention-to-treat (ITT) principle, using data from all participants who enrolled ($n = 190$).

Results

Sprint-E Means for Completers and Non-Completers

Table 1 shows the means on the Sprint-E for 190 enrollees assigned to three groups according to the time of their last assessment: 49 with pretreatment assessment only, 53 with pretreatment and intermediate treatment assessments, and

88 with pretreatment, intermediate treatment, and posttreatment assessments (our primary analysis sample). Referral and pretreatment means did not differ between the three groups, Fs < 1, and intermediate treatment means did not differ between the last two groups, F (1, 139) = 1.97, *ns*. These results suggest that the changes observed in completers were not solely an artifact of selection or mortality biases.

Hypothesis Tests

The statistical tests from the 2 × 4 (Severity by Session) mixed ANOVA design are presented in Table 2, and the trends over time are illustrated in Fig. 2. There was strong support for the hypothesis that significant changes in post-disaster distress would co-occur with CBT-PD. Collapsed across levels of Severity, the improvement between referral and pretreatment means was not statistically significant (M diff = 2.0, SD = 7.3, d = 0.27), whereas the improvements between pretreatment and intermediate treatment and between intermediate treatment and posttreatment were both significant, as hypothesized. However, in contrast to the hypotheses, the change between pretreatment and intermediate treatment (M diff = 10.6, SD = 8.7, d = 1.21) was larger in magnitude than the change between intermediate treatment and posttreatment (M diff = 5.8, SD = 10.2, d = 0.57).

Interactions between Severity and Session were observed for two of the three contrasts between time-points. As shown in Fig. 2, the severe distress group improved between referral and pretreatment (M diff = 2.8, SD = 7.0, d = 0.40), whereas the moderate distress group worsened slightly (M diff = −1.7, SD = 7.6, d = 0.23). This pattern may be a regression artifact, but the study design allowed the effects of treatment to be estimated independently of such biases. The improvement between pretreatment and intermediate treatment assessments was also greater in the severe distress group (M diff = 11.4, SD = 8.9, d = 1.29) than in the moderate distress group (M diff = 6.6, SD = 6.6, d = 1.00). However, the large size of the effects in both groups lessens the clinical significance of the interaction. The severe distress group (M diff = 5.7, SD = 10.1, d = 0.56) and the moderate distress group (M diff = 6.3, SD = 11.1, d = 0.57) improved to an equivalent degree between intermediate treatment and posttreatment assessments.

Table 2 ANOVA table: Effects of session and initial symptom severity on Sprint-E means

Source	*df*	*F*
Between-subject effects		
Severity of initial distress	(1, 86)	15.90***
Within-subject effects		
Session	(3, 86)	60.38***
Referral vs. pretreatment	(1, 86)	<1
Pretreatment vs. intermediate	(1, 86)	58.53***
Intermediate vs. posttreatment	(1, 86)	17.94***
Session by severity	(3, 86)	4.96**
Referral vs. pretreatment	(1, 86)	5.28*
Pretreatment vs. intermediate	(1, 86)	4.12*
Intermediate vs. posttreatment	(1, 86)	<1

* $P < .05$, ** $P < .01$, *** $P < .001$

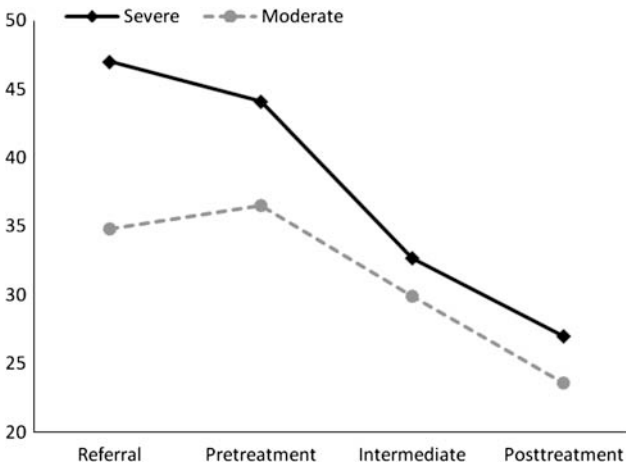

Fig. 2 Trends in Sprint-E means in the primary analysis sample (n = 88) from referral to posttreatment assessments. Separate trends are shown for groups differing in the severity of their distress on the Sprint-E at point of referral. Moderate distress = fewer than 7 intense reactions on the Sprint-E (n = 16); severe distress = 7 or more intense reactions on the Sprint-E (n = 72)

Table 1 Sprint-E means by last time of assessment

Last assessment	Referral		Pretreatment		Intermediate		Posttreatment	
	M	(*SD*)	*M*	(*SD*)	*M*	(*SD*)	*M*	(*SD*)
Pretreatment (n = 49)	44.8	(7.5)	42.3	(10.4)				
Intermediate treatment (n = 53)	44.7	(7.6)	42.0	(8.6)	34.4	(9.6)		
Posttreatment (n = 88)	44.8	(6.9)	42.8	(7.8)	32.2	(8.7)	26.4	(11.5)
Total	44.8	(7.2)	42.4	(8.7)	33.0	(9.1)	26.4	(11.5)

Sprint-E, Short Post-traumatic Stress Disorder Rating Interview—Expanded

Change in Prevalence of Severe Distress

In the primary analysis sample ($n = 88$), the percentage of participants meeting criteria for severe distress (7+ intense reactions) decreased from 61.4% at pretreatment to 13.6% at posttreatment (McNemar exact test, $P < .001$). Among the severe distress group specifically ($n = 72$), these frequencies were 66.7 and 15.3%. The 12 persons who met criteria for severe distress at posttreatment averaged 9.2 intense reactions at pretreatment ($SD = 2.8$, median = 10; total Sprint-E $M = 48$, $SD = 7$) and 9.6 intense reactions ($SD = 1.7$, median = 10; total Sprint-E $M = 47$, $SD = 5$) at posttreatment, evidencing no improvement at all.

Intention-to-Treat Analysis

The effect sizes derived from the intention-to-treat analysis were generally comparable to those based on the ANOVA (complete data). For the entire group of persons who began treatment ($n = 190$), effect sizes were 0.34 for the difference between referral and pretreatment, 1.01 for the difference between pretreatment and intermediate treatment, and 0.60 for the difference between intermediate treatment and posttreatment. For the subset of persons who completed treatment ($n = 88$), effect sizes were 0.27 for the difference between referral and pretreatment, 1.22 for the difference between pretreatment and intermediate treatment, and 0.60 for the difference between intermediate treatment and posttreatment. The overall pre-post effect sizes were, respectively, 1.29, and 1.38.

Follow-Up

About 5 months after completing CBT-PD, 66 participants were reassessed. These 66 adults did not differ from the other 22 completers in Sprint-E scores at referral, pretreatment, intermediate treatment, or posttreatment, ts < 1. The trend line for this subsample mimicked the hypothetical idealized trend closely (Fig. 1), Session $F(4, 260) = 94.75$, $P < .001$. Within the follow-up sample, distress levels at follow-up ($M = 26.3$, $SD = 12.5$) did not differ from distress levels at posttreatment ($M = 26.4$, $SD = 11.6$), $t < 1$. The prevalence of probable severe distress in the follow-up sample was 15% ($n = 10$) at posttreatment and 17% ($n = 11$) at follow-up (McNemar exact test, $P \approx 1.0$).

Discussion

We sought in this evaluation to answer four key questions about CBT-PD. First, do participants improve over the course of CBT-PD? Findings indicate that CBT-PD results in significant changes in distress. The reduction in distress was clinically as well as statistically significant, as evidenced by a large effect size ($d = 1.4$) and reduction in prevalence of severe distress from 61% at pretreatment to 14% at posttreatment. Given that CBT-PD was delivered 16 months postdisaster and that minimal change was observed between intake and session 1, it appears likely that the reduction in distress is due to the treatment. Our second and related question was whether participants would improve more during the interval that emphasized cognitive restructuring than during the earlier interval that emphasized psychoeducation and coping skills. It was expected that cognitive restructuring would be the primary mechanism for change. Instead, the greatest change occurred during the first two sessions of the treatment. It may be that teaching survivors about their symptoms, a breathing technique for managing anxiety resulting from these symptoms, and directing them to engage in pleasant activities to combat avoidance is more potent than we had suspected. Alternatively, the relative strength of the two components may be an artifact of sequencing, with the first treatment component showing the greatest effects. That is, the early response is due to the expectation of further improvement in subsequent sessions and that psychoeducation alone would be insufficient. Future research could examine whether a brief psychoeducational intervention can produce lasting effects on its own.

Third, we asked whether survivors with moderate and severe levels of distress improved comparably. Although we were concerned that CBT-PD might not be appropriate for survivors with severe distress, results suggested that the treatment works equally well for those with severe and moderate levels of stress. However, at posttreatment, a minority of severely distressed individuals will evidence continuing need for treatment, in which case a referral for a more specific intervention is required.

Finally, we asked whether the improvements associated with CBT-PD would be maintained at follow-up. Assuming CBT-PD worked for at least some individuals, we wanted to know if the dose of treatment was adequate to maintain gains. Results showed that the reduction in distress was maintained 5 months posttreatment. The prevalence of severe distress in the follow-up sample was 15% at posttreatment and 17% at follow-up. This finding has increased significance because follow-up assessments were administered by a research assistant and were never viewed by therapists. While there is no way to know whether previous administrations may have biased participants to respond more favorably, the follow-up assessment should not be subject to such influence.

Conducting research in real-world settings is difficult due to the lack of experimental control. It was not feasible in this context to have a no-treatment or wait-list control group. The sponsoring community foundation wanted to

insure that survivors received the best treatment possible as soon as possible. Within these constraints, we attempted to plan an evaluation component that could yield interpretable results. The quasi-experimental approach and repeated measures design increased our confidence that the change in distress was the result of the treatment itself. The fact that moderate change occurred ($d = 0.6$) during the CR interval (intermediate treatment-to-posttreatment) after two previous intervals of assessment (referral-to-pretreatment and pretreatment-to-intermediate treatment) is difficult to attribute to most of the factors that typically threaten the internal validity of single-group designs. Participants enrolled in and completed the program at different points over a 16 months interval, making it unlikely that any one event external to the program could have produced consistently positive change. If anything, the program period (January 2007 through April 2008) continued to be marked by significant stressors for displaced Katrina survivors.

There were clearly issues in participant retention; roughly half of those who enrolled completed the 10-session program. Because this was the first systematic evaluation of CBT-PD, we focused on the outcomes of completers. ITT analyses were highly consistent with the ANOVA (completer) results. There are a number of important questions about recruitment, enrollment, and retention of persons in InCourage that are beyond the purpose of the present paper. Ideally, treatment studies seek participants whose lives are stable, whereas the community targeted by InCourage was anything but. Effective treatment programs for postdisaster distress have to be able to work in settings where day-to-day life remains challenging. Allocating some program resources to support services, such as transportation assistance, might increase survivors' capacity to enroll and complete.

There were several limitations related to the therapist selection, training, and monitoring. In a research study it is typical to select a limited number of highly skilled clinicians and then to train them to a specified criterion. Training often involves both an in-person training followed by closely supervised training cases. In this study, over 100 therapists attended the two-day training and began immediately receiving cases. Bi-weekly case consultation was available in lieu of the more intensive supervision that is part of a clinical trial. Further, because the treatment was not being delivered as part of a treatment study we were unable to tape treatment sessions and monitor adherence. Instead we asked clinicians to report on the presence or absence of key therapeutic elements and followed up with survivors to see if they could describe key skills and also if they used the skills (Hamblen et al. 2009). However, treatment results remained positive even with reduced training and monitoring.

Limited assessment could be viewed as an additional shortcoming. In a research study participants are typically paid for the time required for in-depth assessment. Because participants were not consenting to be research participants and because this evaluation rested on the cooperation of community therapists, we believed that it was critical to keep the assessment short, simple, and clinically useful. Therefore, we limited the assessment to a single 11-item measure of postdisaster distress with strong psychometrics. As a result we had nearly perfect compliance for assessments. While we cannot answer specific questions about changes in a range of diagnoses, the assessment was adequately sensitive to change in distress.

Future research could address these points through a randomized controlled trial. Disaster survivors could be randomized to either CBT-PD or usual care, which would control for the threat of natural recovery. Non-completers could also be re-contacted and assessed to determine how they are functioning at later assessment points. Additionally more intensive assessments could be administered and therapist adherence could be monitored. Authors have secured funding to conduct this trial. If CBT-PD is shown to be effective in this context, there are several possible next steps. A dismantling study could be conducted to determine active treatment components. Depending on enrollment and retention, an intervention could be added to improve these factors.

Despite the limitations, this study advances the field in a number of important ways. CBT-PD, originally developed by the first author and colleagues for use after the September 11th terrorist attacks in New York, was novel for its focus on postdisaster distress. For survivors, the focus on distress and function (rather than on "mental illness") may reduce stigma and improve acceptability of care. For clinicians, the focus on a single intervention allows them to be prepared to respond to a range of clients. For administrators, the reduced training and assessment requirements translate to reduced costs and greater efficiency.

In conclusion, the complementary findings reported by Donahue et al. (2006), in response to the September 11th terrorist attacks, and the present study, in response to Hurricane Katrina, are among the first to have evaluated the effects of a disaster-specific treatment. While the current study lacked the tight control of a university-based clinical trial, it provided information about how CBT-PD works in real-world community practice. Findings support that a treatment focused on postdisaster distress (rather than a specific psychiatric disorder) was well tolerated by disaster survivors with both moderate and severe levels of distress and associated with significant reductions in distress.

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